



# MECHANICS

## Research Communications

LIST OF CONTENTS for Volume 25, 1998

1998

Vol. 25, No. I

### CONTENTS

#### *Scientific and Applied Communications*

- |  |    |   |
|--|----|---|
| Z.-G. JI and C. MENDOZA                        | 3  | Instability of the Viscous Sublayer for Ripple Inception  |
| E. S. YOON, B. N. KIM and M. K. CHUNG          | 15 | Modeling of Three Dimensional Unsteady Flow Effects in Axial Flow Turbine Rotors  |
| A. AVUDAINAYAGAM and J. GEETHA                 | 25 | On the Image System of Certain Line Singularities in the Vicinity of a Circular Cylinder  |
| F. A. YOUSSEF, S. Z. KASSAB and S. F. AL-FAHED | 33 | Low Reynolds Number Axisymmetric Turbulent Boundary Layer on a Cylinder   |
| M. BELHAQ                                      | 49 | New Analytical Technique for Predicting Homoclinic Bifurcations in Autonomous Dynamical Systems                                 |
| H. XIAO, O. T. BRUHNS and A. MEYERS            | 59 | Direct Relationship between the Lagrangean Logarithmic Strain and the Lagrangean Stretching and the Lagrangean Kirchhoff Stress |
| C.-F. GAO and W.-X. FAN                        | 69 | Green's Functions for the Plane Problem in a Half-Infinite Piezoelectric Medium   |
| C. POLIZZOTTO, G. BORINO and P. FUSCHI         | 75 | A Thermodynamically Consistent Formulation of Nonlocal and Gradient Plasticity  |

(Contents Continued)

A. D. DROZDOV	83	A Model of Temporal Polymeric Networks in Nonlinear Viscoelasticity
M. DOLFIN and P. ROGOLINO	91	Acceleration Waves and Stability
G. D. SALENGER and A. F. VAKAKIS	97	Localized and Periodic Waves with Discreteness Effects
A. AGBOSSOU and M. LAGACHE	105	Fiber Distribution Effects in Linear Viscoelastic Behavior of Polymer Matrix Composites: Computation Modelling and Experimental Comparison
V. A. BURYACHENKO	117	Some Nonlocal Effects in Graded Random Structure Matrix Composites

### *Announcements*

1	In Memoriam - Nicholas J. Hoff
14	19 <sup>th</sup> Annual Meeting of the Canadian Applied Mathematics Society
68	Sixth Conference on Shell Structures Theory and Applications
116	20 <sup>th</sup> International Congress of Theoretical and Applied Mechanics

1998

Vol. 25, No. 2

### CONTENTS

#### *Scientific and Applied Communications*

S. C. GUPTA	123	Analytical Solution of a Non-Smooth Freezing Front
L. RESTUCCIA and B. MARUSZEWSKI	137	Nonlinear Thermoelasticity of Ferroelastics
S. M. PIRES-DOMINGUES, H. COSTA-MATTOS and F. A. ROCHINHA	147	Modelling of Nonlinear Damage on Elastic Brittle Materials

(Contents Continued)

V. P. PANOSKALTSIS, S. BAHUGUNA and D. SOLDATOS	155	On the Description of Mechanisms with Different Characteristic Times in Solid Materials: a Non-conventional Approach
C. W. BERT and V. BIRMAN	165	Effects of Stress and Electric Field on the Coefficients of Piezoelectric Materials: One-dimensional Formulation
Y. HU, Y. HUANG, L. CHENG, S. LI, and W. ZHONG	171	Periodic Elliptic Holes in Anisotropic Elasticity
E. A. SHIROKOVA and N. A. IVAN'SHIN	179	The Exact Solution of the Plane Elasticity Problems for the Airfoil Crack with Two Cusps
Z.-G. ZHOU, B. WANG, and S.-Y. DU	183	The Stress Field in the Vicinity of Two Collinear Cracks Subject to Anti-plane Shear in a Strip of Finite Width
C. M. WANG, K. Y. LAM and X.Q. HE	189	Instability of Variable Arc-length Elastica under Follower Force
C. S. CHEN and Y. F. RASHED	195	Evaluation of Thin Plate Spline Based Particular Solutions for Helmholtz-type Operators for the DRM
G.-L. YU, Y.-S. WANG, and B.-Z. GAI	203	In-plane Motion Induced by an SH Pulse at a Frictional Contact Interface
P. CAPODANNO	211	Etude mathématique des petites oscillations d'un liquide dans un container élastiquement suspendu en apesanteur
P.-L. JIANG and L. YU	219	Effect of a Hydrodynamic Thrust Bearing on the Statics and Dynamics of a Rotor-bearing System
T. BALKAN	225	A Dynamic Programming Approach to Optimal Control of Robotic Manipulators
<i>Announcements</i>		
	146	Fourth ECCOMAS Computational Fluid Dynamics Conference: Athens, Greece, September 7-11, 1998

(Contents Continued)

## CONTENTS

*Scientific and Applied Communications*

- |  |     |  |
|--|-----|--|
| C. CERCIGNANI, M. LAMPIS and<br>J. STRUCKMEIER                             | 231 | New Models for the Differential Cross<br>Section of a Polyatomic Gas in the Frame<br>of the Scattering Kernel Theory             |
| R. ABDOLHOSSEINI and R. E. MILANE  | 237 | Vortex In-Cell Simulation of a Spatially<br>Growing Mixing Layer   |
| N. SUBASCHANDAR  | 245 | Mean Velocity Profiles in a<br>Three-Dimensional Turbulent Near-Wake<br>Flow   |
| K. LAUNAY, D. HUILIER and<br>H. BURNAGE                                    | 251 | Lagrangian Predictions of the Dispersion of<br>Heavy Particles in a Dilute Two-Phase Flow:<br>on the Inertia Effect              |
| K. K. YELESWARAPU,<br>M. V. KAMENEVA,<br>K. R. RAJAGOPAL, and J. F. ANTAKI | 257 | The Flow of Blood in Tubes: Theory and<br>Experiment   |
| I. POP and T.-Y. NA  | 263 | A Note on MHD Flow over a Stretching<br>Permeable Surface  |
| T. M. A. EL-MISTIKAWY, H. A. ATTIA,<br>and A. A. MEGAHED                   | 271 | Asymptotic Solution for the Flow Due to an<br>Infinite Rotating Disk in the Case of Small<br>Magnetic Field                      |
| M. A. DE ROSA and C. FRANCIOSI   | 279 | On Natural Boundary Conditions and DQM   |
| E. FREIRE, E. GAMERO, and<br>A. J. RODRIGUEZ-LUIS                          | 287 | Study of a Degenerate Bogdanov-Takens<br>Bifurcation in a Family of Mechanical<br>Oscillators                                    |
| G. Z. VOYIADJIS and<br>A. ZOLOCHEVSKY                                      | 299 | Creep Theory for Transversely Isotropic<br>Solids Sustaining Unilateral Damage   |
| A. FRANGI  | 305 | BE Formulations for 2D Scalar Wave<br>Problems: Regularization of Singular<br>Integrals via the Derivative Transfer<br>Technique |

(Contents Continued)

Z.-T. CHEN	313	Crack Tip Field of an Infinite Piezoelectric Strip under Anti-Plane Impact
Z.-T. CHEN and S.-W. YU	321	Anti-Plane Vibration of Cracked Piezoelectric Materials
Y. W. KWON and C. T. LIU	329	Damage Growth in a Particulate Composite under a High Strain Rate Loading
K. C. JANE and C. C. CHEN	337	Postbuckling Deformation and Vibration of a Delaminated Beam-Plate with Arbitrary Delamination Location
P. C. DUMIR, S. KAPURIA and S. SENGUPTA	353	Assessment of Plate Theories for Hybrid Panel in Cylindrical Bending
S. H. CHEN, P. LIANG and X. N. LI	361	M-P Inverse Method of Topological Variation of Frame Structures

#### *Announcements*

298	1999 ASME Mechanics and Materials Conference
-----	--

1998

Vol. 25, No. 4

#### CONTENTS

##### *Scientific and Applied Communications*

A. EL-GOHARY	371	On the Stability of Relative Programmed Motion of Satellite-Gyrost
H. M. YEHIA	381	A New Integrable Problem in the Dynamics of Rigid Bodies
A. HAMDOUNI and N. TAIBI	385	Kane's Formalism and Lie Group Theory
Y. LIANG, W. GONG, X. YANG and C. ZHOU	395	Identification of Nonlinear Characteristics in Cushioning Packaging Using Genetic Evolutionary Neural Networks
C. FERRARESI, A. M. BERTETTO, L. MAZZA, W. FRANCO and D. MAFFIODO	405	Opening Mechanics of the Aortic Root: Non Homogeneous and Non Isotropic F.E.M. Model of Biological Structure

(Contents Continued)

C. XU	415	Kutta Condition for Sharp Edge Flows
M. WOZNIAK	421	A Corrected 2D-Model of the Subsoil Response
V. I. LEVITAS	427	Thermomechanics and Kinetics of Generalized Second-Order Phase Transitions in Inelastic Materials. Application to Ductile Fracture
T. DESOYER, J.-L. HANUS and V. KERYVIN	437	An Instability Condition of the Deformation Process in Elasto-(Visco)-Non-Linear Materials
P. M. MARIANO and D. BERNARDINI	443	Flow Rules for Porous Elastic Plastic Materials
S. FOREST and K. SAB	449	Cosserat Overall Modeling of Heterogeneous Materials
J. MAKOWSKI and H. STUMPF	455	Strain Localization in Stress-Resultant Theory of Shells
P. ROYIS and H. ROYIS	467	A Rate-Type Mixed Finite Element Method for Large Transformations of Non-Viscous Continua
P. R. MARUR	473	Eigenanalysis of Edge-Cracked Free-Free Timoshenko Beam
B. WU	479	Secondary Buckling of an Elastic Column with a Central Elastic Support
		<i>Announcement</i>
	I	1997 CISM Report

1998

Vol. 25, No. 5

## CONTENTS

*Scientific and Applied Communications*

Y. P. ZHAO	487	Explaining the Analogy between Dislocation Line in Crystal and Vortex Filament in Fluid
G. A. ROGERSON and J. G. MURPHY	493	Surface Waves in Slightly Compressible, Finitely Deformed Elastic Media

(Contents Continued)

S. SHEN, Z.-B. KUANG and S. HU	503	Wave Propagation in Multilayered Anisotropic Media
S. SHEN and Z.-B. KUANG	509	Wave Scattering from an Interface Crack in Laminated Anisotropic Media
Z.-G. ZHOU, J.-C. HAN and S.-Y. DU	519	Investigation of the Scattering of Harmonic Elastic Waves by a Finite Crack Using the Non-Local Theory
J. T. CHEN	529	On Fictitious Frequencies Using Dual Series Representation
T.-H. THAI, P. FRANCESCATO and J. PASTOR	535	Limit Analysis of Unidirectional Porous Media
K. KUMAR and S. PRADEEP	543	Strategies for Three Dimensional Deployment of Tethered Satellites
H. BOUGHOUAS	551	Une méthode de détermination de trains d'engrenages pour réaliser un rapport de transmission donné
S. FREY, M. L. MARTINS-COSTA and R. M. SALDANHA DA GAMA	561	Classical Galerkin Shortcomings on the Steady Heat Conduction Simulation in a Plate with Thermal Source
E. LIGAN	569	Théorèmes d'Euler pour les chocs et percussions sur les systèmes variables: Application
B. A. JUBRAN, M. N. HAMDAN, N. H. SHABANNEH and S. SZEPESSY	583	Wavelet and Chaos Analysis of Irregularities of Vortex Shedding
M. HELLOU and F. MOREAU	593	Sur le calcul du couple et de la résistance pour différents obstacles engendrant des écoulements plans de Stokes dans un canal rectiligne illimité
B. N. MANDAL and U. BASU	599	A Pulsating Line Source in the Presence of a Nearly Circular Cylinder Submerged in Deep Water

*(Contents Continued)*

1998

Vol. 25, No. 6

## CONTENTS

*Scientific and Applied Communications*

- |  |     |  |
|--|-----|--|
| A. TAMBURRINO and F. SANDOVAL                    | 605 | Probability Density Functions of Free-Surface Velocities and Velocity Gradients                                    |
| C. R. JACKSON, W. E. LEAR, JR., and S. A. SHERIF | 613 | Generalized Shock Wave Analysis of Two-Phase Flow  |
| K. A. YIH  | 623 | Coupled Heat and Mass Transfer in Mixed Convection about a Vertical Cylinder in a Porous Medium: the Entire Regime |
| J. STEFANIAK and J. JANKOWSKI                    | 631 | An Approximate Solution of Heat Conduction Equation with Mixed Boundary Conditions of a Rectangular Plate          |
| J. LERBET  | 637 | Decomposition of the Space of Parameters of a Kinematical Chain by its Singularities                               |
| Y. G. MARKOV and S. A. EL-HAFEEZ                 | 643 | The Evolution of a Rotational Motion of an Elastic-Rigid Body about a Fixed Point in a Gravitational Field         |
| V. BIRMAN  | 653 | On the Effect of Cyclic Loading on Material Temperature  |
| L. SIAD and M. MEGUEDDEM                         | 661 | Stability Analysis of Jointed Rock Slope   |
| Y. ZHAO  | 671 | Dugdale Model for Circumferential Through-Cracks in Cylindrical Shells under Combined Tension and Bending          |
| U. GUVEN and O. ALTAY                            | 679 | Linear Hardening Solid Disk with Rigid Casing Subjected to a Uniform Heat Source                                   |
| C.-F. GAO and W.-X. FAN                          | 685 | Green's Functions for Generalized 2D Problems in Piezoelectric Media with an Elliptic Hole                         |
| C.-F. GAO and J.-H. YU                           | 695 | Two-Dimensional Analysis of a Semi-Infinite Crack in Piezoelectric Media   |
| P.R. HEYLIGER and G. RAMIREZ                     | 701 | A Local/Global Matrix Formulation for Laminated Piezoelectric Media  |
|  | 709 | Author Index, Volume 25, 1998  |
|  | I   | List of Contents, Volume 25, 1998  |
|  |     | <i>Announcement</i>  |
|  | 652 | 1999 CISM Program  |



